CHAPTER B3

HAZARDOUS MATERIAL CONTROL AND MANAGEMENT (HMC&M)

B0301. DISCUSSION

a. To attain and maintain operational effectiveness, Navy ships require specified types and quantities of hazardous material (HM). Great care must be taken in handling, using, and storing HM to prevent injury to personnel, damage to equipment, or harm to the environment. Risks associated with HM are greater aboard ship than ashore because of the limited number, confined nature, and "at sea" environment of shipboard spaces. Consequently, special precautions and an effective program to manage HM are both needed. The maintenance of safe and healthful working conditions for HM is a chain of command responsibility. Implementation begins with the commanding officer and extends to the individual sailor.

b. This chapter addresses general management requirements for HM. **Chapters C23 for surface ships and D15 for submarines contain specific management guidance and safety precautions** for the HM subcategories contained in the definition that follows. Commands having dental facilities shall refer to BUMEDINST 6260.30 for direction in implementing mercury control in affected spaces.

c. **For submarines**. This chapter and Chapter D15 provide guidance for all HM, including HM that contains atmosphere contaminants per reference B3-1. Some of these contaminants may be released to the submarine atmosphere during operations involving the use of the HM. When a HM is a source of submarine atmospheric contamination, Chapter D15 provides additional controls on the storage and use of this material.

d. The following definitions apply to Navy HMC&M:

(1) **Hazardous Material (HM)**. Any material that, because of its quantity, concentration, or physical or chemical characteristics, may pose a substantial hazard to human health or the environment when incorrectly used, purposefully released, or accidentally spilled. Subcategories of HM, per reference B3-3 (Hazardous Material Users' Guide), include:

(a) Acids

(b) Adhesives

(c) Alkalis/Bases/Caustics

(d) Cleaning compounds

(e) Compressed gases

(f) Corrosion preventive compounds

(g) Detergents/Soaps

(h) Greases

(i) Hydraulic fluids

(j) Inspection penetrants

(k) Lubricants/oils

(l) Paints

(m) Photo chemicals

(n) Polish/Wax compounds

(o) Solvents (Hydrocarbons)

(p) Thermal insulation

(q) Water treatment chemicals

(r) Oxidizers

(s) Fuels

(t) Heavy metals

(u) Batteries

(v) Pesticides

Not included in this definition are ammunition, weapons, explosives, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, pharmaceutical supplies (if not considered hazardous based on composition, physical form, and review of procedures which may involve the handling/dispensing of the materials), medical waste and infectious materials, bulk fuels, and radioactive materials. Even though the above items may not be considered HM, submarine atmosphere control requirements in chapter D15 may apply. Asbestos and lead require special guidance for handling and control, which are addressed in Chapter B1 and B10 respectively.

(2) **Hazardous Waste (HW)**. Any discarded material (liquid, solid, or gas) which meets the definition of HM and/or is designated as a hazardous waste by the Environmental Protection Agency or a State authority.

NOTE:

The Federal Facilities Compliance Act of 1992 states that any HW aboard an operational Navy ship is not subject to the storage, manifest, inspection, or recordkeeping requirements of the Resource Conservation and Recovery Act unless such waste is transferred to the ship within territorial waters of the U.S. and is stored on that ship for more than 90 days.

(3) **Used or Excess Hazardous Material (Used/Excess HM)**. HM for which there is no further, immediate use on board the ship possessing the material. Used HM is material that has been used in a shipboard process. Excess HM is unused material in full, properly sealed containers. Such material may ultimately be used on another ship, within the shore establishment, for a purpose other than that for which it was initially manufactured, or by commercial industry. Ships are required to transfer used or excess HM to a Navy shore activity for determination of suitability for further use. Navy shore activities possess trained personnel who can determine, working with ship's personnel, whether shipboard HM is usable, reusable, or should be disposed of as HW. The shore activity will act as the HW generator if it determines that the material has no further use and dispose of it as required by Federal, state, and local regulations.

B0302. SURFACE SHIP HMC&M

a. **Responsibilities**

(1) **The commanding officer shall:**

(a) Report to the Fleet Commanders by message, information to the chain of command, any conditions or system/equipment malfunctions that results in an overboard discharge of HM within restricted waters per reference B3-1 and applicable Operations Orders (OPORDs).

(b) Appoint a commissioned officer within the Supply Department as HM coordinator. On surface ships smaller than a frigate, appoint a commissioned officer as HM coordinator. Ships and afloat activities specifically designated by the type commander in which the number of assigned officers is limited and appointment would pose an excessive burden to the ship may assign a chief or leading petty officer as HM coordinator.

(2) **Division officers shall**:

(a) Ensure that NAVSEA-approved, in-space storage lockers are used.

(b) Ensure that HM retained within their workcenters is specific to the operations and maintenance of assigned equipment. If a HAZMINCEN is in operation, no more than a 7-day supply of common-use HM may be retained in workcenter spaces.

(c) Ensure used or excess HM is properly returned to the HM supervisor/HAZMINCEN.

(d) Ensure that approved personal protective clothing and equipment are available for HM operations or incidents and personnel are trained in their proper use and maintenance.

(e) Make personnel available to receive required HM training as detailed in section B0302e.

(f) Mark any PCB-containing electrical or electronic components per reference B3-3 and associated NAVSEASYSCOM-issued PCB advisories.

(3) **The safety officer shall** report all HM mishaps as required by Chapter A6.

(4) **The afloat environmental protection coordinator (AEPC) shall** perform the functions described in reference B3-2.

(5) **The damage control assistant shall**:

(a) Implement a spill contingency plan (SCP) per paragraph B0302c.

(b) Train and supervise ship's damage control teams (and fire department, if used aboard) in combating spills of HM.

(c) Provide training to divisions regarding reporting, initial handling, and cleanup of HM spills, as requested.

(d) Maintain the Hazardous Material Spill Response Kits (AEL 2-550024007).

(e) Ensure that HM spills are handled per appendix B3-A.

(6) **The supply officer/HM coordinator shall**:

(a) Ensure a Material Safety Data Sheet (MSDS) is on file (either hard copy or on CD-ROM) for all types and brands of HM taken aboard. Ensure that hard-copy MSDSs are readily accessible to personnel and their supervisors.

(b) If an O-4 or below, obtain commanding officer’s (or designated O-5's) written authorization prior to open purchasing any HM.

(7) **The HM supervisor shall**:

(a) Provide control and inventory management of designated ship’s HM. For ships FFG and larger, manage the operation of the ship’s HM minimization center (HAZMINCEN).

(b) Maintain the Hazardous Material Information System (HMIS) which contains MSDS information (see paragraph B0302d(2)). Retain hard copy MSDSs for locally purchased material and for materials not covered in the HMIS. Forward copies of MSDSs which are not on this system to: Commanding Officer, Navy Environmental Health Center, Attn: HMIS (Code 341), 2510 Walmer Avenue, Norfolk, VA 23513-2617.

(c) Ensure receipt and consolidation (as appropriate) of all used HM. Supervise document preparation for offload of used/excess HM. Prior to the ship getting underway, ensure that no HM remains on the pier.

(d) Ensure personnel assigned to the HAZMINCEN (HAZMINCEN operator(s)) are trained on duties and responsibilities prior to assuming these duties.

(e) Ensure that when HM is transferred into other containers, the new containers are properly marked with the information specified in paragraph C2302e. The requirement to transfer HM into other containers shall be limited to HM which is specific to the division. Where possible, HM shall be obtained from the HAZMINCEN in containers sized to the user's need.

(8) **The MDR shall**:

(a) Assist the HM supervisor and work center supervisors in training personnel regarding health information and personal protective equipment requirements for the HM they are using.

(b) Maintain a complete MSDS file. This may be HMIS on CD-ROM or hardcopy.

(9) **Division supply petty officers (when there is no HAZMINCEN aboard or for HM specific to the division) shall** order only authorized material. Standard stock HM shall be used whenever possible to avoid procurement of open purchased HM.

(10)**Workcenter supervisors shall**:

(a) Ensure that approved personal protective clothing and equipment are maintained and used.

(b) Ensure that prior to initial use or handling any HM, workcenter personnel have been trained on the hazards associated with that material and are familiar with what an MSDS is, what it contains, and where a copy is available for review. Learning resources for this training are available at http://www.norva.navy.mil/navosh.

(11)**All hands shall**:

(a) Return HM to approved stowage or the HAZMINCEN upon completion of use or at the end of the workday.

(b) Properly use and handle HM.

(c) Collect and segregate any residue resulting from use of HM for turn-in to the supply department/HAZMINCEN.

(d) Report any spills of HM to the officer of the deck, and/or Damage Control Central/Central Control Station.

(e) Properly stow or return to the HAZMINCEN/supply department any HM found improperly stowed in work or berthing spaces.

(f) Report any violation of HM use, storage, and handling precautions to the supervisor.

(g) Ensure that when HM is transferred into other containers, the new containers are properly marked with the information specified in paragraph C2302e. The requirement to transfer HM into other containers shall be limited to HM specific to the division. Where possible, HM shall be obtained from the HAZMINCEN in containers sized to the user's need.

b. **Hazardous Material Control and Management Elements.** The following elements are essential for effective surface ship HM control and management:

(1) Designation of adequate storage for HM (see chapter C23)

(2) Controlling HM purchase (including type and quantity of material required), receipt, and issue to avoid accumulation of excessive HM (see chapter C23)

(3) Following approved safety standards for the use of HM (see chap-

ters B1, B8, B10, and C23 for specific HM use requirements)

(4) Reutilization of HM to reduce the amount of used HM generated (see chapter C23)

(5) Collecting, segregating, and disposing of used or excess HM (see chapter C23)

(6) Responding to HM emergencies (see B0302c)

(7) Obtaining and providing MSDSs for on board HM (see chapter C23)

(8) Training (see B0302e)

(9) Proper labeling of HM (see chapter C23).

c. **HM Emergency Response.** The DCA shall use Appendices B3-A and B3-B as HM spill response procedures in preparation for possible HM spills or releases to the environment. These plans include information on spill response team makeup, spill cleanup equipment location, internal and external spill reporting criteria, as well as procedures that are unique to the ship. Reporting requirements for a HM spill which goes over the side are found in reference B3-2, Chapter 19. Appendix B3-B is specific to mercury.

d. **HM Information**

(1) **MSDS**. MSDSs are technical bulletins containing information about materials, such as composition, chemical, and physical characteristics, health and safety hazards, and precautions for safe handling and use. MSDSs shall be maintained for every item of HM aboard either through the HMIS (see paragraph B0302d(2)) or by hard copy for open purchased items. They shall be readily accessible to supervisors and personnel who actually use or handle HM. Supervisors are required to provide instruction in MSDS understanding and use. All personnel using HM shall be trained on the dangers and precautions contained within the MSDS before they actually use those materials.

(2) **Hazardous Material Control and Management (HMC&M) Compact Disc-Read Only Memory (CD-ROM)**. The HMC&M CD-ROM is a Navy data application which contains the HMIS, Hazardous Material User's Guide (HMUG), Ships' Hazardous Material List (SHML), and the Shipboard Safety Equipment Shopping Guide. The HMIS is a compilation of MSDS data applicable to DOD. If a MSDS is not available for material provided to the ship for use, the HMIS shall be scanned to determine if such data are resident within it. Chapter C23 contains storage requirements and coding found on some items listed in HMIS. The HM supervisor shall maintain the HMIS. Ensure that only the most current version is used.

(3) **Hazardous Material User's Guide (OPNAV Publication P-45-110-91, NSN (0420-LP-181-6600)**. The Hazardous Material Users' Guide (HMUG) is a publication which provides the fleet with easily understandable safety and health information to supplement the technical data found in MSDSs. The information in this guide is designed to assist HM users in protecting themselves and the environment. The contents of the guide include control measures, precautions, health hazards, spill control guidance, and disposal guidelines for 22 HM groups. It also provides a personal protective equipment shopping guide. The guide should be readily available and used in every workcenter. Applicable sections can be copied and posted in areas where specific HM groups are frequently handled or stored.

(4) **Shipboard Safety Equipment Shopping Guide (NAVSAFECEN Publication)**. This publication consolidates standard stock numbers for safety equipment and personal protective equipment.

(5) **Federal Logistics Data on Compact Disc (FEDLOG)**. This disc contains the Management List, Navy (MLN), which includes additional information on HM. The Special Material Content Code (SMCC) for NSNs used by the Navy can be found in the Management Control (MGT CTL) field. The SMCC Code is in the seventh position of that field.

(6) **Hazardous Material Inventory Control System (HICS)**. HICS is a menu-driven inventory control system. It assists the operator in the systematic, positive control and issue of hazardous material. It has the following capabilities:

(a) Prints bar-code control numbers for each item of HM issued.

(b) Lists master HM inventory by type and location for use in determining HM on hand.

(c) Tracks HM usage and containers issued to the department, division, workcenter, or individual level.

(d) Produces receipts, inventory reports, and other customized reports.

(e) Tracks inventory high and low stock level limits.

(f) In conjunction with a scanner, allows remote site recording/tracking of returned containers or site inventory.

(7) **CNO Policy Guide for Shipboard Hazardous Material Container Disposal (OPNAV Publication P-45-114-95)**. This publication provides guidance on the disposal of containers that formerly held HM. The guidance document provides a simple decision flow chart to assist the user in rapidly determining whether a HM container is an "empty container" and if it is, whether it may be disposed of as trash or as used HM.

e. **HM Training**

(1) The HM coordinator shall normally receive en route training at the Navy Supply Corps School Basic and Department Head Courses. HM coordinators who are not Supply Corps officers shall attend the Afloat HM Coordinator Course (A-8B-0008) taught by the Naval Occupational Safety and Health and Environmental Training Center (NAVOSHENVTRACEN). The course shall be completed prior to, or within 6 months of, being assigned this duty.

(2) The HM supervisor shall be a graduate of the HMC&M Technician (SNEC 9595) course (A-322-2600). If the ship has a HAZMINCEN, at a minimum the HM supervisor shall also be a graduate of the CHRIMP/HICS Technician course. Both courses are taught by the NAVOSHENVTRACEN.

(3) Damage control teams required to combat an emergency involving HM, and the ship's fire department (if used aboard) shall receive training on HM emergency procedures. The damage control assistant shall ensure that at least one spill response drill is conducted every 18 months.

(4) Audiovisual materials applicable to HM can be found in appendix

A7-F.

B0303. SUBMARINE HMC&M

a. **Responsibilities**

(1) **The commanding officer shall:**

(a) Report all HM mishaps as required by Chapter A6.

(b) Report to the Fleet Commanders by message, information to the chain of command, any conditions or system/equipment malfunctions that results in an overboard discharge of HM within restricted waters per reference B3-2 and applicable Operations Orders (OPORDs).

(c) Ensure that spills of HM are handled per the Ships System Manual (SSM) Toxic Gas Bill.

(2) **The executive officer shall:**

(a) Grant written permission to carry or use on board any restricted HM during an underway period. Refer to chapter D15 and reference B3-1 for definitions of submarine material control usage categories.

(b) Ensure assigned personnel follow the conditions under which restricted or limited HM are stored or used on board to minimize the release (off-gassing, mists, or vapors) of potential atmospheric contaminants into the submarine.

(c) Review the Submarine Material Control Log prior to each underway operation of 24 hours or greater, conducted in the recirculation mode, to ensure that restricted (R) items have been removed from the submarine.

(3) **Department heads shall:**

(a) Ensure that HM retained within their work centers is unique to the operations and maintenance of assigned equipment and does not exceed the quantity needed to satisfy operational requirements.

(b) Ensure used or excess HM is properly returned to the supply officer for turn over to the shore activity.

(c) Report items found with a restricted, limited, or prohibited (X) use code (not in the Submarine Material Control Log) to the supply officer for logging, labeling, assignment of approved storage location, or disposal.

(d) Obtain written permission from the executive officer to retain on board or use restricted items during underway operations.

(e) Ensure that restricted items authorized for in port use only are removed from the submarine as soon as the need for them no longer exists. Inform the Supply Officer of their removal to allow documentation in the Submarine Material Control Log.

(f) Ensure that all HM in their custody are used, handled, and stowed per the requirements of Chapter D15.

(4) **The supply officer/HM coordinator shall**:

(a) Ensure that management of shipboard HM follows procedures outlined in this chapter and Chapter D15.

(b) Ensure an MSDS is on file (either hard copy or on CD-ROM) for all types and brands of HM taken aboard. Ensure that hard-copy MSDSs are readily accessible to personnel and their supervisors. Maintain the HMIS and SMCL which contains MSDS information (see paragraph B0303d(1)).

(c) Ensure no prohibited HM is brought on board.

(d) Maintain the Submarine Material Control Log per paragraph D1502d.

(e) Ensure all HM brought on board is authorized for storage and use onboard by the Submarine Material Control List (SMCL). Affix an Atmosphere Contaminant Label for any material that is a restricted or limited HM.

(f) Initiate an investigation of any item suspected of being an atmosphere contaminant per the procedures of reference B3-1 and submit a SMCL feedback report per chapter D-15.

(g) Ensure that all restricted (R) and limited (L) items are inventoried every six months or prior to a change of command.

(h) Review the Submarine Material Control Log weekly in port and monthly underway.

(i) Obtain commanding officer’s written authorization prior to open purchasing any HM.

(5) **The MDR shall**:

(a) Assist work center supervisors in training personnel regarding health information and personal protective equipment requirements for the HM they are using.

(b) Provide medical assistance in the event of a HM spill or mishap involving HM. Use MSDS information in SMCL provided by supply officer.

(6) **Division officers shall**:

(a) Ensure when HM is transferred into other containers the new containers are properly marked with the information specified in paragraph D1502d.

(b) Ensure approved personal protective clothing and equipment are available for HM operations or incidents and personnel are trained in their proper use and maintenance.

(c) Ensure personnel are made available to receive required HM training as detailed in section B0303e.

(d) Mark any PCB-containing electrical or electronic components per chapter D15.

(7) **The damage control assistant shall**:

(a) Train and supervise ship's damage control efforts to combat HM spills. Conduct HM spill response drills as necessary.

(b) Provide training to divisions regarding reporting, initial handling, and cleanup of HM spills, as requested.

(c) Maintain an OTTO FUEL spill kit (AEL A006350027) to respond to HM emergencies.

(8) **Repair parts petty officers shall** ensure before HM is ordered, that a valid requirement (specifically required by a maintenance procedure or other shipboard operation) exists. Standard stock HM shall be used whenever possible to avoid procurement of open purchased HM.

(9) **Workcenter supervisors shall**:

(a) Ensure that approved personal protective clothing and equipment are maintained and utilized.

(b) Ensure that prior to using or handling any HM, workcenter personnel have been trained on the hazards associated with that material and are familiar with what an MSDS is, what it contains, and where a copy is available for review.

(c) Ensure that a valid maintenance requirement exists for any HM item not listed in the SMCL and initiate a SMCL feedback report.

(10) **All hands shall**:

(a) Ensure that HM is returned to appropriate stowage upon completion of use or at the end of the workday, whichever is earlier.

(b) Follow instructions provided for the proper use of HM.

(c) Collect and segregate any used HM for proper offload per chapter D15.

(d) Report any spills of HM to the duty officer (in port) or the chief of the watch (underway).

(e) Report any violation of HM use, storage, and handling precautions to the supervisor for resolution/correction.

(f) Be alert to prevent the onboard storage and use of restricted material during underway operations without prior approval/authorization from XO. Ensure limited material is being used per SMCL guidance.

b. **Hazardous Material Control and Management Elements.** The following elements are essential for effective submarine HM control and management:

(1) Proper use of HM per SMCL guidance (see chapter D15)

(2) Designation of adequate storage for HM (see chapter D15)

(3) Controlling HM purchase (including type and quantity of material required), receipt, and issue to avoid accumulation of excessive HM (see chapter D15)

(4) Avoiding open purchases of HM (see chapter D15)

(5) Following approved safety standards for the use of HM (see chapters B1, B8, and D15 for specific requirements on use of HM)

(6) Reutilization of HM to reduce the amount of used HM generated (see chapter D15)

(7) Collection, segregation, and disposal of used or excess HM (see chapter D15)

(8) Responding to HM emergencies (see B0303c)

(9) Obtaining and providing MSDSs for on board HM (see chapter D15)

(10) Training (see B0303e)

(11) Proper HM labeling (see chapter D15)

c. **HM Emergency Response**. Hazardous material emergency response shall be conducted per the Toxic Gas Bill. The DCA shall follow the Toxic Gas Bill in preparation for possible HM spills or releases to the environment. Reporting requirements for a HM spill which goes over the side are found in reference B3-2, Chapter 19.

d. **HM Information**

(1) **MSDS**. MSDSs are technical bulletins containing information about materials, such as composition, chemical, and physical characteristics, health and safety hazards, and precautions for safe handling and use. MSDSs shall be maintained for every HM item aboard either through the SMCL (see paragraph B0303d(4)) or by hard copy for open purchased items. They shall be readily accessible to supervisors and personnel who actually use or handle HM. Supervisors are required to provide instruction in MSDS understanding and use. All personnel using HM shall be trained on the dangers and precautions contained within the MSDS before they actually use those materials.

(2) **Hazardous Material Control and Management (HMC&M) Compact Disc-Read Only Memory (CD-ROM)**. The HMC&M CD-ROM is a Navy data application which contains the HMIS, Hazardous Material User's Guide (HMUG), SHML, and the Shipboard Safety Equipment Shopping Guide. The HMIS is a compilation of MSDS data applicable to DOD. If a MSDS is not available for material provided to the ship for use, the HMIS shall be scanned to determine if such data are resident within it. The supply officer shall maintain the HMIS. Ensure that only the most current version is used.

(3) **Hazardous Material User's Guide (OPNAV Publication P-45-110-91, NSN (0420-LP-181-6600)**. The HMUG is a publication that provides the ships with understandable safety and health information to supplement the technical data found in MSDSs. The information in this guide is designed to assist HM users in protecting themselves and the environment. The contents of the guide include control measures, precautions, health hazards, spill control guidance, and disposal guidelines for 22 HM groups. It also provides a personal protective equipment shopping guide. The guide should be readily available and used in every workcenter. Applicable sections can be copied and posted in areas where specific HM groups are frequently handled or stored.

(4) **CNO Policy Guide for Shipboard Hazardous Material Container Dis-**

posal (OPNAV Publication P-45-114-95). This publication provides guidance on the disposal of containers that formerly held HM. The guidance document provides a simple decision flow chart to assist the user in rapidly determining whether a HM container is an "empty container" and if it is, whether it may be disposed of as trash or as used HM.

(5) **The Submarine Material Control List (SMCL)**. The SMCL is a Navy data application that lists the authorized HM for use on submarines as established by reference B3-1.

e. **Training**

(1) The HM coordinator receives en route training at the Navy Supply Corps School Basic Course.

(2) The leading SK shall be a graduate of the HMC&M Technician (SNEC 9595) course (A-322-2600).

(3) Personnel expected to combat an emergency involving HM shall receive training on HM emergency procedures.

(4) Audiovisual materials applicable to HM can be found in appendix A7-F.

CHAPTER B3

REFERENCES

B3-1 NAVSEA Manual S9510-AB-ATM-010(U), Nuclear Submarine Atmosphere Control Manual (NOTAL)

B3-2 OPNAVINST 5090.1B, Environmental and Natural Resources Program Manual (NOTAL)

B3-3 NAVSEA S593-A1-MAN-010, Shipboard Management Guide to PCBs (NOTAL)

Appendix B3-A

HAZARDOUS MATERIAL SPILL RESPONSE PROCEDURES (SURFACE SHIPS ONLY)

1. **Introduction**. Because of the extremely hazardous nature of many materials used aboard ships, only trained personnel shall respond to a hazardous material (HM) spill. Personnel shall be trained by division officers or supervisory personnel to clean up small spills of HM. Appropriate Material Safety Data Sheets (MSDSs) shall be used to conduct training.

Response procedures for many specific situations are provided in other documents. See Naval Warfare Publication (NWP) 62-1, Surface Ship Survivability for repair party responsibilities. See Naval Ships Technical Manual (NSTM) 555 for shipboard HM fire fighting procedures; NSTM Chapter 079, Volume 2 for HM damage control procedures; and NSTM Chapter 077 for personal protective equipment guidance. See NAVAIR 00-80-R-14 for aircraft HM fire fighting procedures. These spill procedures apply to on board HM spills. Response for HM and oil spills over-the-side is contained in reference B3-2.

For descriptive purposes, the spill response procedures have been divided into nine phases:

a. Discovery and Notification.

b. Initiation of Action.

c. Evaluation.

d. Containment and Damage Control.

e. Dispersion of Gases/Vapors.

f. Cleanup and Decontamination.

g. Disposal of Contaminated Materials.

h. Certification for Re-entry.

i. Follow-up Reports.

Each response phase is **not** a separate response action entirely independent of all other phases. Several phases may occur simultaneously and may involve common elements in their operation. For example, containment and damage control may also involve cleanup and disposal techniques.

2. **Spill Discovery and Notification**

a. Spills or potential spills of HM may be discovered by regularly scheduled inspections of storerooms and workshops, by detection devices such as fire alarms and oxygen deficiency detectors, and during routine operations. All discoveries of spills or situations that may lead to a spill must be verbally reported **immediately** to supervisory personnel and the officer of the deck (OOD)/command duty officer (CDO). Crewmembers are **not** to remain in the area to investigate the spill. Whenever possible, however, the discoverer /initial response team shall report the following information:

(1) Time of spill discovery.

(2) Location of spill.

(3) Identification of spilled material.

(4) Behavior of material (reactions observed).

(5) Source of spill (e.g., tank or container).

(6) Personnel in vicinity of spill (list by name and department).

(7) Volume of spill.

(8) Anticipated movement of spill (e.g., leakage to lower deck passage from amidships toward galley).

(9) Labeling or placarding information (copy data from spilled container only after exposure to spill is eliminated).

b. Overboard spills of reportable quantities of HM shall be reported per reference B3-2.

3. **Initiation of Action**. Coordination and direction of spill response efforts at the scene of an HM spill shall be accomplished by the ship's OOD, CDO, fire chief, damage control party leader, or senior person at the scene, as appropriate, who shall initiate the following actions:

a. Evacuate all personnel from areas that may be exposed to the spilled material.

b. Cordon off the affected area.

c. Arrange first aid for injured personnel.

CAUTION:

Do not enter the contaminated area until the necessary protective clothing and equipment have been determined.

d. Establish a command post and communications network.

e. Prevent spills from entering other compartments by any means that do not involve personnel exposure to the spill, such as closing drains, ventilation ducts, doors, and hatches.

f. Disperse gases or vapors to weather using blow-out (forced exhaust) ventilation or by natural ventilation such as opening doors or hatches. If atmosphere is suspected to be flammable or explosive, only explosion-proof fans shall be used for blow-out ventilation.

g. Eliminate any fire or explosion hazards such as electrical equipment, incompatible materials, and open flames.

4. **Evaluation**. Proper evaluation of a spill can prevent fires, explosions,

personal injury, or permit steps to lessen their impact. This evaluation consists of the following three steps:

a. Obtain as much of the following information as possible from container labels and MSDS before starting response actions:

(1) Type and concentration of the spilled material.

(2) Hazardous characteristics of the spilled material, such as:

(a) Flash Point

(b) Toxicity

(c) Corrosiveness

(d) Potentially incompatible substances

(e) Effects resulting from exposure (fainting, dizziness, skin or eye irritation, nausea)

(f) First aid measures for exposure

b. Determine dangerous conditions or potential consequences of the spill, including:

(1) Fire or explosion.

(2) Presence of oxygen-deficient atmosphere in compartment.

(3) Presence of toxic or explosive gases.

(4) Possibility of dangerous vapors being drawn into ship's ventilating system.

(5) Other HM in the compartment that would play a role in a fire or explosion or is incompatible with the spilled material.

c. Determine from the MSDS the appropriate spill response equipment and protective clothing necessary for safe and effective response.

5. **Containment and Damage Control**. Actions taken during this phase are directed toward controlling the immediate spread of the spill and minimizing the impact to the ship and crew. Depending on the type of spill, some or all of the following procedures may be employed:

a. Fight fire (if any), being careful to use fire fighting methods compatible with the material involved. Fire fighting procedures are provided in NSTM Chapter 555, "Fire Fighting, Ships."

b. Shut off or otherwise stem the spill at its source, whenever feasible, by:

(1) Replacing leaking containers.

(2) Plugging leaks in tanks.

(3) Emptying tank of remaining contents.

(4) Encapsulating a leaking container into a larger, liquid-tight container.

(5) Segregating leaking containers.

c. Predict spill movement and take further action to prevent the spill from possibly entering other compartments by closing scuppers, drains, ventilation ducts, doors, or hatches.

d. Contain liquid material using barriers, such as sand, upholstery, sorbents, or other equipment suitable to dam the flow.

6. **Dispersion of Gas/Vapor**. If a flammable gas or vapor is released as a result of the spill, the gas/vapor shall be dispersed or diluted as soon as possible. The gas/vapor shall not be allowed to enter other compartments. In some cases, the explosive atmosphere shall be contained and diluted to lower its concentration below the Lower Explosive Limit (LEL). Have the gas free engineer check the spill area for LEL and toxicity. The atmosphere can then be dispersed by one of the following methods:

a. Normal exhaust ventilation (explosion-proof only).

b. Blow-out ventilation (powerful exhaust ventilation provided in some HM storerooms--explosion-proof only).

c. Doors and hatches open to the weather.

d. Portable fans (explosion-proof only).

7. **Cleanup and Decontamination**. During this response phase, personnel, as directed by the person in charge, shall employ the spill cleanup methods recommended on the MSDS or, in the case of a mercury spill, those outlined in Appendix B3-B. All surfaces shall be thoroughly cleaned of the spilled material. After the spill cleanup, the compartment shall be thoroughly ventilated. Reusable protective clothing shall be thoroughly decontaminated and otherwise maintained before it is returned to its proper storage location.

NOTE:

Identification of specific requirements for respiratory protection and proper use of this equipment is a critical aspect of all cleanup and decontamination operations.

8. **Disposal of Contaminated Materials**. All non-reusable cleanup materials are to be placed in impermeable containers, stored and disposed of as hazardous waste per appendix L of reference B3-2. These materials include unrecoverable protective clothing, sorbents, rags, brooms, and containers.

9. **Certification for Safe Re-Entry**. The spaces affected by the spill shall be certified safe by the OOD/CDO before normal shipboard operations are resumed in that space. The OOD/CDO shall ascertain the following before al-

lowing re-entry:

a. All surfaces--deck, counters, bulkheads, and overheads--have been thoroughly cleaned of the spilled material.

b. All compartments have been adequately ventilated as determined from analysis by the gas free engineer.

c. All contaminated cleanup materials, including protective clothing, have been packaged, marked and handled as used HM.

10. **Follow-up Reports**. The OOD/CDO shall submit to the HM coordinator a spill report for all on board spills. A copy of this report shall be filed by the safety officer and shall contain the following information:

a. Date spill occurred.

b. Spill location.

c. Identity of spilled material.

d. Cause(s) of spill.

e. Damage or injuries resulting from the spill.

f. Response and cleanup measures taken.

g. Any problems encountered.

h. Method of disposing of contaminated material.

i. Action taken to prevent the repeat of a similar spill.

Appendix B3-B

MERCURY SPILL RESPONSE AND CLEANUP PROCEDURES (SURFACE SHIPS ONLY)

1. **Mercury Spill Cleanup Procedures**. Procedures shall vary according to the size and complexity of the spill.

a. **Broken Fluorescent Bulbs**

(1) Set up local exhaust ventilation.

(2) Carefully sweep up bulb debris and double bag for disposal as HM.

(3) Clean the area with a solution of HgX decontaminant from mercury spill kit.

b. **Small Spills**: Clean mercury spills with 50 grams (3/4 teaspoon or quarter size) or less immediately as follows:

(1) If spill is in a confined area, set up local exhaust ventilation. If ventilation cannot be provided, a suitable respirator should be worn.

(2) Spill cleanup personnel shall not eat, drink, smoke or apply cosmetics in spill area. They shall wash thoroughly with soap and water after cleanup.

(3) Apply absorbent material from mercury spill kit to spilled mercury and dispose as HM.

(4) Wipe down spill area with HgX solution from spill kit.

(5) Discard any contaminated materials and protective clothing and dispose as HM.

c. **Large Spills**: Clean mercury spills of more than 50 grams (3/4 teaspoon or quarter size) immediately as follows:

(1) Stop work operations in the area.

(2) Warn personnel of the spill and its location, evacuate the area and establish safe boundaries.

(3) Call the mercury spill team.

(4) Use a mercury vapor meter to determine mercury vapor and degree of hazard, if possible.

(5) Apply absorbent material from mercury spill kit to spilled mercury and dispose as HM.

(6) Wipe down spill area with HgX solution from spill kit.

(7) Discard any contaminated materials and protective clothing and dispose as HM.

(8) Use a mercury vapor meter to detect any residual mercury. Reclean

with HgX if mercury vapor concentration exceeds 0.05 mg/m3.

(9) Use the mercury vapor meter after 24 hours to determine mercury vapor concentration. An allowable concentration of <0.01 mg/m3 must be attained in any space to be continually occupied by an individual for 8 or more hours daily.

2. **Mercury Waste Disposal**. Mercury is an environmental pollutant and must not be discharged into any body of water or released into any ship's waste disposal system. Disposal should be coordinated with the HM Coordinator and shore facility.